

The Listing of Claims

1 – 8. (Canceled).

9. (New) A direct-injection two-stroke engine having a cubic capacity of 125 cc at most and a combustion chamber delimited by:

- a cylinder having a longitudinal axis, at least one inlet port and at least one exhaust port ;

- a piston having a substantially flat crown and moved along the longitudinal axis by a connecting rod connected to a crankshaft; and

- a cylinder head provided with a sparkplug and an injector adapted to spray a jet of liquid fuel under pressure into said combustion chamber along a jet injection axis and with a jet diffuser angle γ from 15° to 75° ,

wherein said combustion chamber has a first diametral plane containing said longitudinal axis of the cylinder and centered on said exhaust port and a second diametral plane perpendicular to said first diametral plane,

said sparkplug is in a first portion of said cylinder head extending from the second diametral plane towards said inlet port,

said injector is disposed in a bore in said cylinder head oriented along a determined axis and in said first diametral plane in a second portion of the cylinder head complementary to said first portion, and

said jet injection axis is at a first angle α from 30° to 70° to a transverse plane of said cylinder and a second angle β from $+45^\circ$ to -45° to said first diametral plane,

wherein said jet injection axis is at an non-zero angle δ to said cylinder head bore determined axis,

wherein a control system is adapted to command the commencement of injection of fuel when said crankshaft is at an angular position from 45° to 20° ahead of the angular position of closure of said exhaust port, and

wherein the fuel injection pressure and the orientation of said jet injection axis are determined as a function of the flow of the gases in said combustion chamber to obtain a substantially stoichiometric air/fuel mixture in the region of said sparkplug at the moment of ignition.

10. (New) An engine according to claim 9, wherein injection of fuel begins when said crankshaft is situated in an angular position from 40° to 30° ahead of the angular position of closure of said exhaust port.

11. (New) An engine according to claim 9, wherein said fuel injection pressure is from 50 bars to 150 bars.